

Trend Study 10R-33-02

Study site name: PR Spring Livestock Enclosure.

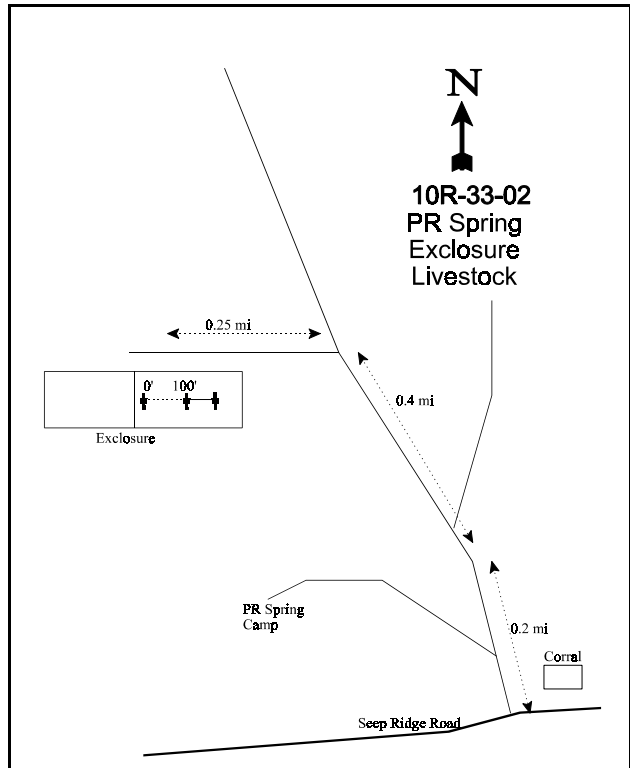
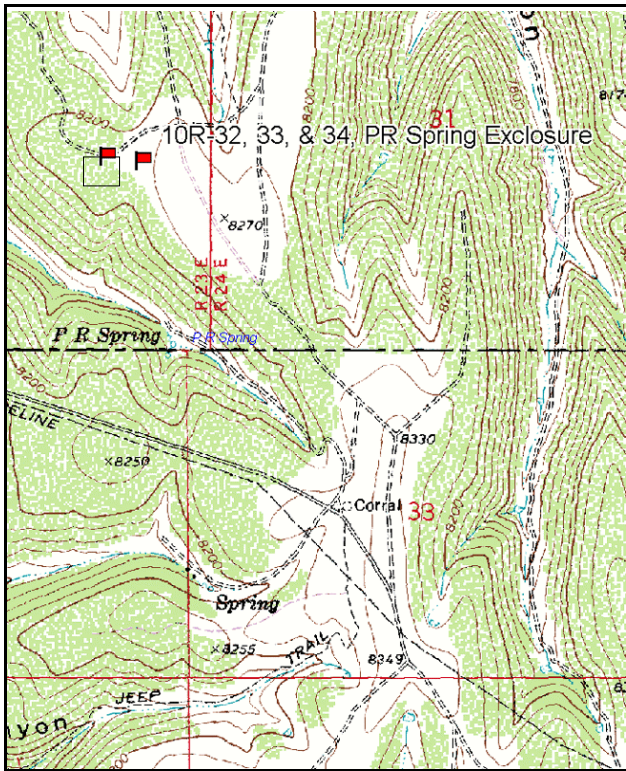
Vegetation type: Mountain Brush.

Compass bearing: frequency baseline 80 degrees magnetic.

Frequency belt placement: line 1 (34, 59, & 95ft), line 2 (11, & 71ft).

LOCATION DESCRIPTION

On the Seep Ridge Road go to the PR Spring turnoff. Travel 0.2 miles staying right (do not go down road to PR Spring and campground). Continue left 0.4 miles. Turn left once again and travel approximately 0.25 miles to a weather station then the exclosure. The 0-foot stake in the livestock exclosure is located near the fence separating the total and livestock exclosures. The 0-foot stake is marked by browse tag number 423.

Map Name: P R Spring

Diagrammatic Sketch

Township 15S, Range 23E, Section 36

GPS: NAD 27, UTM 12S 4369912 N 647435 E

DISCUSSION

PR Spring Livestock Exclosure - Study No. 10R-33

This transect samples the livestock exclosure at PR Spring which is accessible to wildlife, but excludes livestock. The sampling baseline lies just east of the total exclosure baseline. Physical characteristics are the same as those reported for the total exclosure transect. The sampling baseline within the livestock exclosure is also only 200 feet in length. One observation worth noting is that the browse component within the livestock exclosure is not as thick compared to the total exclosure. Use inside the livestock exclosure prior to exclosure construction was light to moderate by wildlife and light by livestock. Pellet group transect data from 2002 estimated 19 elk days use/acre (46 edu/ha), 48 deer days use/acre (117 ddu/ha), and 14 cow days use/acre (34 cdu/ha). As with the total exclosure, cattle use inside the livestock portion of the exclosure was that prior to the exclosures construction. Elk and deer pellets appeared to be late winter and spring. Wildlife have been able to remain at higher elevations due to several consecutive mild winters preceding the 2002 reading.

Soils are clay loam in texture and neutral in reactivity (pH of 6.7). Effective rooting depth along this transect was estimated at just under 12 inches in 2002. Penetrometer readings also reveal that the upper 8-12 inches of the profile are very rocky. Vegetation and litter cover are abundant and adequate to keep erosion at a minimal level. Bare ground was moderate in 2002 at 20%. The erosion condition classification was determined as stable in 2002.

Although diverse and abundant, the browse component in the livestock exclosure is not as dense as that in the nearby total exclosure. Line-intercept canopy cover for browse was estimated at just over 45% in 2002. Serviceberry, mountain big sagebrush, and true mountain mahogany represent the key browse species. Together they provide 66% of the browse cover, or 41% of the total vegetation cover within the livestock exclosure. Serviceberry had an estimated density of 1,760 plants/acre in 2002, with a high proportion of young in the population (52%), moderate to heavy use, and low decadence. Vigor was good as well. Mountain big sagebrush density was estimated at 3,240 plants/acre, with most of the population consisting of mature and decadent plants. In 2002, the young age class was moderately abundant (460 young plants/acre), but not adequate to replace the combination of decadent plants classified as dying and the number of dead individuals that were sampled. Mahogany density was estimated at 1,240 plants/acre in 2002. The population shows low decadence, normal vigor, moderate to heavy use, and moderately high recruitment with the young age class making up 34% of the population. Average annual leader growth on all of the key browse was about two inches of growth in 2002.

As with the total exclosure, snowberry has the highest density of all the browse species within the livestock exclosure at 4,640 plants/acre in 2002. Use was light, vigor normal, and decadence low. Bitterbrush, while highly preferred, occurs in low density at 320 plants/acre. Bitterbrush shows heavy use, normal vigor, and low decadence (13%). Other browse sampled within the livestock exclosure include dwarf rabbitbrush, low rabbitbrush, broom snakeweed, Gambel oak, and grey horsebrush.

The understory is slightly more abundant within the livestock exclosure than it was in the total exclosure. Grasses provided 24% of the total vegetation cover on the site, with forbs providing an additional 16% cover. Grass diversity is low, but composed entirely of perennial species. *Carex* was the most abundant species providing nearly 9% average cover which accounted for 63% of the total grass cover. Kentucky bluegrass and thickspike wheatgrass were also moderately abundant. Grasses showed no utilization in 2002.

The forb component has fair diversity and good composition. Two species, an *astragalus* and mat penstemon, are the dominant species as they accounted for 74% of the total forb cover in 2002. Desirable forbs included pale agoseris, Utah milkvetch, yellow Indian paintbrush, tapertip hawksbeard, redroot eriogonum, Lewis flax, lobeleaf groundsel, and globemallow.

APPARENT TREND ASSESSMENT

Soils are in good condition due to good vegetation and litter cover and the nearly level terrain. Bare ground is moderately high at 20%, but with a dry spring and summer, this is not excessive. Trend for soil appears stable. The browse component appears healthy overall. Preferred species provide the bulk of the total cover and have good recruitment from young plants, low decadence, and generally good vigor. Use on the key species is moderate to heavy, except on mountain big sagebrush, which shows mostly light use. Less preferred increasers such as broom snakeweed and stickyleaf low rabbitbrush are only a minor component and should remain so. The herbaceous understory has fair diversity, but good composition within the livestock enclosure. Although a handful of species are dominant, many desirable species are present and should increase with better precipitation in the future. Trend for both the browse and the herbaceous understory components appears stable.

HERBACEOUS TRENDS --

Herd unit 10R, Study no: 33

T y p e	Species	Nested Frequency	Quadrat Frequency	Average Cover %
		'02	'02	'02
G	Agropyron dasystachyum	102	41	1.14
G	Agropyron spicatum	1	1	.00
G	Carex spp.	187	64	8.90
G	Poa fendleriana	24	12	.57
G	Poa pratensis	136	39	3.43
G	Sitanion hystrix	5	1	.03
Total for Annual Grasses		0	0	0
Total for Perennial Grasses		455	158	14.08
Total for Grasses		455	158	14.08
F	Agoseris glauca	7	3	.02
F	Antennaria rosea	12	7	.11
F	Astragalus spp.	146	64	5.00
F	Astragalus utahensis	5	3	.04
F	Castilleja flava	25	12	.35
F	Cirsium spp.	8	4	.02
F	Crepis acuminata	5	2	.01
F	Erigeron eatonii	130	52	.83
F	Eriogonum racemosum	22	11	.20
F	Eriogonum umbellatum	14	9	.14
F	Lepidium spp. (a)	5	4	.02
F	Linum lewisii	9	5	.02
F	Lupinus argenteus	2	1	.15
F	Machaeranthera canescens	13	8	.11
F	Penstemon caespitosus	217	78	1.85
F	Phlox longifolia	90	34	.32
F	Polygonum douglasii (a)	5	2	.01
F	Potentilla gracilis	1	1	.00

T y p e	Species	Nested Frequency '02	Quadrat Frequency '02	Average Cover % '02
F	Senecio multilobatus	3	1	.00
F	Sphaeralcea coccinea	11	3	.06
F	Taraxacum officinale	4	4	.02
Total for Annual Forbs		10	6	0.02
Total for Perennial Forbs		724	302	9.31
Total for Forbs		734	308	9.34

BROWSE TRENDS --

Herd unit 10R, Study no: 33

T y p e	Species	Strip Frequency '02	Average Cover % '02
B	Amelanchier utahensis	53	5.44
B	Artemisia tridentata vaseyana	79	15.19
B	Cercocarpus montanus	31	3.41
B	Chrysothamnus depressus	4	.04
B	Chrysothamnus viscidiflorus viscidiflorus	48	1.00
B	Gutierrezia sarothrae	4	.03
B	Mahonia repens	1	-
B	Purshia tridentata	14	.48
B	Quercus gambelii	4	.01
B	Symphoricarpos oreophilus	80	9.72
B	Tetradymia canescens	17	.62
Total for Browse		335	35.95

CANOPY COVER -- LINE INTERCEPT

Herd unit 10R, Study no: 33

Species	Percent Cover '02
Amelanchier utahensis	9.08
Artemisia tridentata vaseyana	17.67
Cercocarpus montanus	5.08
Chrysothamnus viscidiflorus viscidiflorus	1.17
Gutierrezia sarothrae	.03
Purshia tridentata	1.25
Quercus gambelii	.17
Symphoricarpos oreophilus	10.67
Tetradymia canescens	.17

Key Browse Annual Leader Growth
Herd unit 10R , Study no: 33

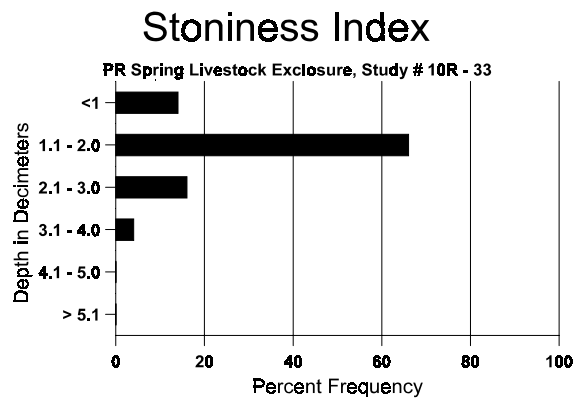
Species	Average leader growth (in) '02
Amelanchier utahensis	2.0
Cercocarpus montanus montanus	2.2
Artemisia tridentata vaseyana	1.9

BASIC COVER --
Herd unit 10R, Study no: 33

Cover Type	Nested Frequency '02	Average Cover % '02
Vegetation	427	52.09
Rock	57	1.24
Pavement	273	6.34
Litter	475	46.46
Cryptogams	3	.03
Bare Ground	280	20.18

SOIL ANALYSIS DATA --
Herd Unit 10R, Study no: 33, PR Spring Livestock Exclosure

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
11.71	-	6.8	35.3	32.7	32.0	3.6	14.9	291.2	0.8



PELLET GROUP FREQUENCY --

Herd unit 10R, Study no: 33

Type	Quadrat Frequency '02	Pellet Groups per Acre '02	Days Use per Acre (ha) '02
Rabbit	11	-	-
Elk	7	244	19 (46)
Deer	14	618	48 (117)
Cattle	3	165	14 (34)

Pellet count for pre-exclosure use.

BROWSE CHARACTERISTICS --

Herd unit 10R, Study no: 33

A G E	Y R	Form Class (No. of Plants)										Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4					
Amelanchier utahensis																			
S	02	4	-	-	1	-	-	-	-	-	5	-	-	-	100			5	
Y	02	18	1	-	21	4	-	2	-	-	44	2	-	-	920			46	
M	02	1	7	6	3	7	12	1	-	-	37	-	-	-	740	45	43	37	
D	02	-	-	1	-	-	3	1	-	-	3	-	-	2	100			5	
X	02	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1	
% Plants Showing '02		<u>Moderate Use</u> 22%					<u>Heavy Use</u> 25%					<u>Poor Vigor</u> 02%				<u>%Change</u>			
Total Plants/Acre (excluding Dead & Seedlings)															'02	1760	Dec:	6%	
Artemisia tridentata vaseyana																			
S	02	6	-	-	-	-	-	-	-	-	6	-	-	-	120			6	
Y	02	22	-	1	-	-	-	-	-	-	23	-	-	-	460			23	
M	02	70	2	8	1	-	-	-	-	-	81	-	-	-	1620	29	37	81	
D	02	42	8	7	1	-	-	-	-	-	40	-	-	18	1160			58	
X	02	-	-	-	-	-	-	-	-	-	-	-	-	-	400			20	
% Plants Showing '02		<u>Moderate Use</u> 06%					<u>Heavy Use</u> 10%					<u>Poor Vigor</u> 11%				<u>%Change</u>			
Total Plants/Acre (excluding Dead & Seedlings)															'02	3240	Dec:	36%	
Cercocarpus montanus																			
S	02	1	-	-	3	-	-	-	-	-	4	-	-	-	80			4	
Y	02	14	5	-	2	-	-	-	-	-	21	-	-	-	420			21	
M	02	6	3	17	-	1	12	-	-	-	39	-	-	-	780	50	36	39	
D	02	-	-	-	-	-	2	-	-	-	2	-	-	-	40			2	
X	02	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2	
% Plants Showing '02		<u>Moderate Use</u> 15%					<u>Heavy Use</u> 50%					<u>Poor Vigor</u> 00%				<u>%Change</u>			
Total Plants/Acre (excluding Dead & Seedlings)															'02	1240	Dec:	3%	

A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4	5	6	7	8	9	1	2	3	4			
Chrysothamnus depressus																	
M	02	4	2	-	-	-	-	-	-	-	6	-	-	-	120	3 8	6
% Plants Showing '02		<u>Moderate Use</u> 33%			<u>Heavy Use</u> 00%			<u>Poor Vigor</u> 00%			<u>%Change</u>						
Total Plants/Acre (excluding Dead & Seedlings)														'02	120	Dec:	-
Chrysothamnus viscidiflorus viscidiflorus																	
Y	02	13	-	-	-	-	-	-	-	-	13	-	-	-	260		13
M	02	84	-	-	4	-	-	-	-	-	88	-	-	-	1760	11 11	88
D	02	3	1	-	3	-	-	-	-	-	5	-	-	2	140		7
% Plants Showing '02		<u>Moderate Use</u> .92%			<u>Heavy Use</u> 00%			<u>Poor Vigor</u> 02%			<u>%Change</u>						
Total Plants/Acre (excluding Dead & Seedlings)														'02	2160	Dec:	6%
Gutierrezia sarothrae																	
Y	02	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2
M	02	8	-	-	-	-	-	-	-	-	8	-	-	-	160	4 6	8
D	02	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2
% Plants Showing '02		<u>Moderate Use</u> 00%			<u>Heavy Use</u> 00%			<u>Poor Vigor</u> 00%			<u>%Change</u>						
Total Plants/Acre (excluding Dead & Seedlings)														'02	240	Dec:	17%
Mahonia repens																	
M	02	-	-	-	6	-	-	-	-	-	6	-	-	-	120	- -	6
% Plants Showing '02		<u>Moderate Use</u> 00%			<u>Heavy Use</u> 00%			<u>Poor Vigor</u> 00%			<u>%Change</u>						
Total Plants/Acre (excluding Dead & Seedlings)														'02	120	Dec:	-
Purshia tridentata																	
Y	02	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2
M	02	-	-	6	-	1	4	-	-	1	12	-	-	-	240	12 25	12
D	02	-	-	1	-	-	1	-	-	-	2	-	-	-	40		2
% Plants Showing '02		<u>Moderate Use</u> 06%			<u>Heavy Use</u> 81%			<u>Poor Vigor</u> 00%			<u>%Change</u>						
Total Plants/Acre (excluding Dead & Seedlings)														'02	320	Dec:	13%

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Quercus gambelii																		
Y	02	2	-	-	1	-	-	1	-	-	4	-	-	-	80		4	
M	02	-	-	-	1	-	-	-	-	-	1	-	-	-	20	17	7	
% Plants Showing '02		<u>Moderate Use</u> 00%			<u>Heavy Use</u> 00%			<u>Poor Vigor</u> 00%			<u>%Change</u>							
Total Plants/Acre (excluding Dead & Seedlings)														'02	100	Dec:	-	
Symphoricarpos oreophilus																		
Y	02	46	-	-	7	-	-	4	-	-	57	-	-	-	1140		57	
M	02	135	6	-	28	-	-	1	-	-	170	-	-	-	3400	15	25	
D	02	5	-	-	-	-	-	-	-	-	2	-	-	3	100		5	
X	02	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
% Plants Showing '02		<u>Moderate Use</u> 03%			<u>Heavy Use</u> 00%			<u>Poor Vigor</u> 01%			<u>%Change</u>							
Total Plants/Acre (excluding Dead & Seedlings)														'02	4640	Dec:	2%	
Tetradymia canescens																		
Y	02	6	-	-	-	-	-	-	-	-	6	-	-	-	120		6	
M	02	23	-	4	-	-	-	-	-	-	27	-	-	-	540	4	5	
D	02	1	2	-	-	-	-	-	-	-	3	-	-	-	60		3	
% Plants Showing '02		<u>Moderate Use</u> 06%			<u>Heavy Use</u> 11%			<u>Poor Vigor</u> 00%			<u>%Change</u>							
Total Plants/Acre (excluding Dead & Seedlings)														'02	720	Dec:	8%	

PR Spring Exclosure Complex - Summary

Because the exclosure complex was built only the year prior to the establishment of these transects, treatment effects cannot be determined from the data at the present time. However, the data does provide a baseline for the vegetation community sampled by these studies. Future readings will allow monitoring of changes and comparisons between the treatments to be evaluated.

It is important to point out that the exclosure complex was not built in a totally homogeneous area. The total and livestock exclosures were placed in an area where several browse species are moderately abundant. This includes large, tree-like serviceberry plants that provide an abundance of overhead canopy cover. The transect that monitors the community outside of the exclosures is much more open where mountain big sagebrush is the dominant species. Due to the dimensions of the exclosure, the transects established inside the total and livestock exclosures are only 200 feet in length, while the transect outside is 500 feet long. Some of the difference in vegetation characteristics between these studies arises from differing transect lengths as well as the heterogeneity of the vegetation community.

Basic ground cover characteristics are similar between all of the transects. Vegetation and litter cover are abundant, especially the browse component. Bare ground ranges from 16% inside the livestock exclosure to only 7% within the total exclosure. Rock and pavement are low on all the treatments.

The browse component dominates the vegetation community on all transects. Inside the total exclosure, browse accounts for 74% of the total vegetation cover. Shrubs provide about 60% of the vegetation cover both inside the livestock exclosure and outside the exclosure complex. Herbaceous species, especially forbs, are somewhat limited on these studies. Grasses provide respectively 28%, 24%, and 11% of the vegetation cover in the total exclosure, livestock exclosure, and outside the exclosure complex. Forbs provide 16% or less of the total cover on all sites.